

# Outpatient health service utilization and associated factors: a population-based study

## Fatores associados à utilização de serviços ambulatoriais: estudo de base populacional

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### Keywords

Health services, utilization. Health services accessibility. Equity in access. Socioeconomic factors.

### Abstract

#### Objective

To identify factors that lead people to visit a doctor in Brazil and assess differences between socioeconomic groups.

#### Methods

A cross-sectional study comprising 1,260 subjects aged 15 or more was carried out in southern Brazil. Demographic, socioeconomic, health needs and regular source of care data were analyzed concerning visits to a doctor within two months from the interview. Adjusted prevalence ratios and 95% confidence intervals were calculated using Poisson regression.

#### Results

Adjusted PR showed that women having stressful life events, health insurance, and a regular doctor increased the outcome. A dose-related response was found with self-reported health, and the probability of visiting a doctor increased with health needs. Analysis in the chronic disease group revealed that uneducated lower income subjects had a 62% reduction in the chance of visiting a doctor compared to uneducated higher income ones. However, as it was seen a significant interaction between income and education, years of schooling increased utilization in this group.

#### Conclusions

Results suggest the existence of health inequity in the poorest group that could be overcome with education. Specific measures reinforcing the importance of having a regular doctor may also improve access in the underserved group.

### Descritores

Serviços de saúde, utilização. Acesso aos serviços de saúde. Equidade no acesso. Fatores socioeconômicos.

### Resumo

#### Objetivo

Identificar os fatores que levam uma pessoa a consultar o médico no Brasil e avaliar as diferenças entre grupos socioeconômicos.

#### Métodos

Foi realizado um estudo transversal com 1.260 pessoas de 15 anos ou mais no sul do Brasil. Foram analisados dados demográficos, socioeconômicos, de necessidade em saúde e de fonte definida para consulta quanto a visita ao médico nos últimos dois meses. Foram calculadas as razões ajustadas de prevalência (RP) e os Intervalos de Confiança de 95% (IC 95%), utilizando a regressão de Poisson.

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### **Resultados**

*As RP ajustadas mostraram que mulher, eventos estressantes, seguro de saúde e médico de referência aumentaram a probabilidade do desfecho. Foi encontrada uma relação de tipo dose-resposta com auto-avaliação do estado de saúde, e a probabilidade de consultar aumentou a medida que a necessidade em saúde também aumentou. A análise no grupo com doença crônica evidenciou que o grupo de menor renda e sem escolaridade teve uma redução de 62% na probabilidade de visitar o médico em comparação com o grupo de maior renda e sem estudo. Contudo, como ocorreu interação significativa entre renda e educação, o tempo de estudo melhorou a utilização nesse grupo.*

### **Conclusões**

*Os resultados sugerem a existência de iniquidade no grupo mais pobre que pode ser modificada pela educação. Medidas específicas reforçando a importância de ter um médico de referência podem também melhorar o acesso dos mais pobres.*

## **INTRODUCTION**

The reasons that lead people to visit a doctor come from a complex interaction of different factors such as demographic, socioeconomic, and psychological aspects, morbidity profiles, and health services availability.<sup>2,5</sup> The effect and relative importance of each factor are affected by cultural background, health policies and health care system available.

As lower socioeconomic groups have a higher burden of disease and therefore need more health services, equity is at the heart of the entire health care issue. In Brazil, a universal decentralized and free of charge health care system was created, the Unified Health System (SUS), following the promulgation of the 1988 Federal Constitution. Reforms have occurred since then, but there is evidence that, despite intended universal provision, health services utilization among social groups remains unequal.<sup>1</sup> Furthermore, there is limited information about how demographic, socioeconomic, health needs and other factors affect health service utilization in the country.

The present study focused on these issues, and examined the characteristics of people who had visited a doctor within two months from the interview, and assessed the system's equity by examining prevalence ratios of visit to a doctor across socioeconomic groups in the highest level of health needs, defined as those patients with chronic diseases.

## **METHODS**

### **Study design and sample**

A cross-sectional study was carried out from January through May 2000 on a probabilistic sample drawn from a population aged 15 years and over, living in the municipality of Rio Grande, state of Rio Grande do

Sul, southern Brazil. Rio Grande has a population of 200,000 people, and only 5% live in the rural area. Most of the health services used by the population are part of the Unified Health System (SUS).

The sampling process included a cluster sampling where 45 out of 242 census tracts were selected, followed by a random sampling where one block was identified in each cluster. Every third household was visited until it made 12 houses. A total of 1,348 persons were visited.

Trained interviewers using a previously pre-coded and pre-tested questionnaire interviewed the subjects. Independent operators entered the information into an Epi-Info 6.04b database. The investigators checked for consistency and amplitude errors, and corrected them. The database was then converted to Stata 6.0<sup>14</sup> for statistical analysis.

### **Variables**

The outcome, defined as visit to a doctor, was measured within two months of the day of the interview. Socioeconomic variables included family per capita income for the last month prior the study, education and unemployment. Demographic variables were age, gender, race and marital status. Family stress was determined by a questionnaire measuring family dysfunction,<sup>13</sup> and dichotomized as absent (score 0-4) or present (score 5-10). For social support, it was assessed through expected help from friends or relatives when there was any problem, and dichotomized in never/sometimes and many times/always. Stressful life events were defined as the number of stressful situations (e.g. robbery, death of significant others, injuries) within the last year,<sup>8</sup> and categorized as none, one, or two and more. Having a regular doctor was assessed by means of two subsequent questions: a) "If you have a health problem and decided to see a

doctor, is there any physician you often see?" and b) "What is your doctor's name?" It was considered positive if the subject answered yes to the first question, and remembered the doctor's name. Regular care site was assessed similarly. Health insurance was considered positive if the subject had any other health insurance besides the SUS one. Health needs were assessed by asking subjects about: a) having at least one potential serious symptom within the last two months (the list included breathlessness, chest pain, blood in urine or stools, and excessive vaginal bleeding) b) having a chronic health condition c) inactivity days, defined as impossibility of carrying out his/her usual activities for at least one day during the previous two months because of a health condition d) self-reported health, addressed by the question "How was your health in the last two months prior the interview: excellent, good, regular or poor?" e) minor psychiatric disorders, assessed by SRQ-20,<sup>11</sup> using a five/six cut-off point for men and a seven/eight for women.

Socioeconomic differences in health services utilization was measured by assessing visit rates to a doctor among different income groups with the highest level of need, defined as those with chronic health conditions. Two models were created. The first one comprised socioeconomic factors adjusted for demographic variables. The second one included the first model plus regular source of care (doctor or site), a variable that can improve health access as showed in other studies.<sup>6</sup>

A conceptual framework was used for analysis based upon the hierarchical level of determination.<sup>15</sup> The first level is represented by socioeconomic and demographic factors, which determine all other factors. Immediately below are family stress, social support and stressful life events, which can affect some variables on the next level. In the third level are placed regular source of care, health insurance and health needs variables, which are closer to the outcome.

### Statistical analysis

All statistical analyses were performed using Stata version 6.0 for Windows. A cut-off point for  $p$  was previously fixed at 0.05. In the bivariate analysis, prevalence ratios (PR) and 95% confidence intervals (CI) were calculated and Chi-square test was used to assess their significance. Linear trends were explored for ordinal categorical data.

A Poisson model was applied in the multivariate analysis. The choice of this method of regression is justified because of the high frequency of visits to a

doctor in the time period of two months. Under such circumstances, OR would overestimate RR, and would yield an inaccurate measure of the utilization rates and ratios. As the study focuses on utilization of health services, a PR would be more helpful and useful. It has been suggested the use of models such as Cox regression in order to directly estimate the PR.<sup>7</sup> The problem with this approach is that CIs are excessively large. If the observational periods are the same for every case, the Poisson regression is equivalent to the Cox model with the advantage that it is possible to correct the CI by using a robust estimation of the variance, based in sandwich estimators.<sup>9</sup> Therefore, and according to what was suggested by Hirakata,<sup>4</sup> a Poisson regression with robust estimation of variance was used in order to obtain a direct estimation of the PR with corrected CI. Combined with this procedure, and performed during the analysis, the option "cluster", available in Stata, was used since it takes into account the possibility of non-independent observations in each census tracts.

A Wald test was carried out to assess the variables significance. If ordinal, a linear hypothesis test was performed. The variables were entered using a hierarchical approach, as mentioned before. At each level of the model, all the corresponding variables were introduced and a backward regression technique was performed. Variables with a  $p=0.2$  and/or a  $PR=1.5$  were kept for the next level to avoid negative confusion. Interaction terms were introduced for income and education, and regular doctor and health insurance, and their significance tested with a heterogeneity test.

## RESULTS

### Factors associated to visiting a doctor

Of the 1,348 subjects visited in 540 households, 1,260 answered the questionnaire (93%). Monthly per capita mean income for the study sample was US\$ 168.30 (SD 225.00). The mean age was 40.3 yrs (SD 17.71). There was 7% of illiteracy and the mean years of schooling was 6.62 (SD 3.65). Two-thirds had visited the doctor in the last year (66%) and almost one-third (28.7%) did so in the last two months prior to the interview. Other characteristics of the studied sample can be seen in Table 1.

Unadjusted PRs showed that none of the socioeconomic factors had any significant association with the outcome (Table 1). For education, each year of schooling reduced by 1% the chance of utilization (PR 0.99; 95%CI 0.96-1.01;  $p=0.3$ ). Among demographic factors, women, age groups 25-44 yrs and 65 yrs. or over, and divorced people were significantly

**Table 1** - Sample characteristics, prevalence and crude prevalence ratios for visiting according to studied variables. Rio Grande, Brazil, 2000. (N=1,260).

Characteristic		Frequency % (N)	Prevalence visiting a doctor % (N)	PR (95% CI)	p
Monthly per capita income US\$ (1US\$=1.80R\$)	195-5000	24.3 (302)	31.8 (96)	1	0.3*
	93-194	25.6 (318)	28.9 (92)	0.91 (0.69-1.19)	
	57-92	22.4 (279)	28.7 (80)	0.90 (0.67-1.21)	
	0-56	27.7 (344)	25.5 (88)	0.80 (0.64-1.01)	
Unemployment	No	91.9 (1,145)	28.3 (324)	1	0.4
	Yes	8.9 (112)	32.1 (36)	1.14 (0.85-1.51)	
Gender	Male	46.1 (581)	22.0 (128)	1	0.001
	Female	53.9 (679)	34.3 (233)	1.56 (1.29-1.87)	
Age groups	15-24	23.9 (301)	23.0 (69)	1	0.07*
	25-44	37.1 (467)	31.0 (141)	1.32 (1.03-1.69)	
	45-64	27.8 (351)	28.5 (100)	1.24 (0.95-1.62)	
	65 or more	11.2 (141)	36.2 (51)	1.58 (1.17-2.13)	
Race	White	84.7 (1,067)	29.1 (310)	1	0.5
	Black and others	15.3 (193)	26.4 (51)	0.91 (0.71-1.17)	
Marital status	Married	61.3 (772)	29.4 (227)	1	0.02*
	Divorced	6.6 (83)	41.0 (34)	1.39 (1.05-1.84)	
	Single	26.9 (340)	22.6 (77)	0.77 (0.62-0.96)	
	Widowed	5.2 (65)	35.4 (23)	1.20 (0.85-1.70)	
Family stress (0-10)	Score 0-4	91.0 (1,140)	28.9 (329)	1	0.7
	Score 5 or more	9.0 (113)	27.4 (31)	0.95 (0.69-1.30)	
Stressful life events	None	57.2 (721)	26.9 (194)	1	0.04**
	1	31.0 (391)	28.4 (111)	1.06 (0.87-1.29)	
	2 or more	11.8 (148)	37.8 (56)	1.41 (1.11-1.79)	
Social support	Never/sometimes	19.3 (243)	29.6 (72)	1	0.7
	Many times/always	80.7 (1,013)	28.5 (289)	0.96 (0.75-1.20)	
Health insurance	No	61.6 (963)	24.0% (186)	1	0.001
	Yes	38.4 (484)	36.0% (174)	1.50 (1.26-1.77)	
Regular source of care	None	22.8 (283)	14.8% (42)	1	0.001*
	Regular place	36.3 (452)	28.5% (129)	1.92 (1.46-2.53)	
	Regular doctor	40.9 (509)	36.7% (187)	2.48 (1.90-3.23)	
Serious symptom (last 2 mo.)	No	76.6 (963)	25.0 (241)	1	0.001
	Yes	23.4 (294)	41.0% (119)	1.62 (1.35-1.93)	
Chronic health problem	No	74.6 (938)	25.4 (238)	1	0.001
	Yes	25.4 (320)	38.4% (123)	1.52 (1.27-1.81)	
Inactivity days (last 2 mo.)	No	91.2 (1,146)	26.3 (301)	1	0.001
	Yes	8.8 (111)	53.1 (59)	2.02 (1.66-2.47)	
Self-reported health (last 2 mo.)	Excellent	23.6 (297)	15.2% (45)	1	0.001**
	Good	56.4 (711)	25.5% (181)	1.68 (1.25-2.26)	
	Poor/regular	20.0 (252)	53.6% (135)	3.54 (2.54-4.74)	
Minor psychiatric disorders	Male	12.7 (74)	35.1% (26)	1.75 (1.22-2.49)	0.004
	Female	22.1 (150)	46.7% (70)	1.51 (1.22-1.87)	

PR: prevalence ratio.  
\*P for at least one PR ≠1.  
\*\*linear trend test.

associated with visiting a doctor. A significant dose-response relationship was found between stressful life events and the outcome. Other factors associated with visiting a doctor were regular source of care (with a dose-response relationship), and health insurance. Every one of the health needs variables showed a significant association with visiting a doctor, and in the case of self-reported health a dose-response relationship was established.

The results of the multivariate analysis can be seen in Table 2. After adjusting for other variables of the first level, women continue to have a higher probability of visiting a doctor. For income, the lowest income group with no education had a 56% reduction in the probability of visiting a doctor. However, this difference was reduced if this group had any years of schooling by means of an interaction between education and income. For the other groups, as PRs were very near to one and education was

inversely associated with outcome, more years of schooling determined a reduction in the probability of visiting a doctor.

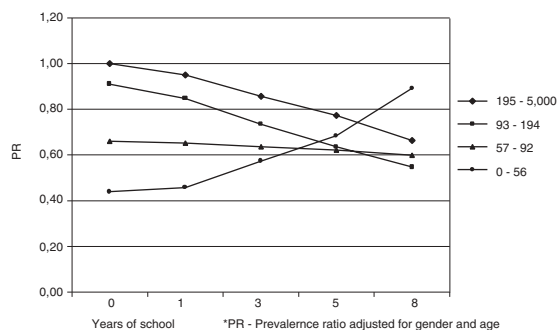
In the second level, after adjusting for remaining factors from the previous level, the dose-response relationship observed for stressful life events, remained significant with little changes in the PR's.

In the last level, and after adjusting for all other factors that remained in the model, regular source of care persisted associated with the outcome keeping a dose-response relationship, although in practice with very similar PR's. Health insurance remained associated with the outcome. An interaction between regular doctor and health insurance was explored without any significant result. Among health need variables, self reported-health, with a dose-response relationship, inactivity days, and potential serious symptom, remained significantly associated with the outcome.

### Social differences in utilization

Table 3 presents the results of socioeconomic variables analyzed in the group with higher level of needs, here represented by those with chronic health conditions. After adjusting for demographic factors (age and sex), the lowest income group without a single year of education had a 62% reduction in the probability of using health services when compared to those belonging to the highest income group without any year of schooling (model A).

Because of the interaction between income and school-



**Figure 1** - Modifier effect of schooling across income groups with chronic disease in the PR\* for visiting a doctor. Rio Grande, Brazil, 2000.

ing, as years of education in the lower income group increased, so did the probability of visiting a doctor. The other groups had interaction terms very close to one, and as schooling had an inverse association, the effect was a reduction in the PR for visiting a doctor.

In Figure 1 it can be observed the effect of schooling for the four income groups. The lowest income group showed an increase of PR as years of education also increased. For the two higher income groups, due to reasons mentioned before, more years of education meant a reduction in the probability of visiting a doctor. For the income group 57-92, the modifier effect of schooling is quite smooth. The values were obtained using the formula:

$$PR \text{ of income} \times PR \text{ of schooling}^{yrs \text{ of school}} \times (PR \text{ income} \times schooling)^{yrs \text{ of school}}$$

After controlling for the variable “regular source of care” (doctor or site), which can affect the probability of utilization among social groups, there was an improvement in PRs (model B). The gap for the lowest income group was further reduced if this group had some education and a regular source of care (Figure 2).

### DISCUSSION

There are some constraints that could have affected the results. First, it is impossible to discard a

**Table 2** - Adjusted prevalence ratios for visiting a doctor, and socioeconomic, demographic, social, health services and health need variables. Rio Grande, Brazil, 2000.

Characteristic		PR (CI 95%)	p
Age by group <sup>a</sup>	15-24	1	0.08*
	25-44	1.40 (1.07-1.83)	
	45-64	1.23 (0.92-1.64)	
	65 or more	1.39 (0.96-2.01)	
Gender <sup>a</sup>	Male	1	0.001
	Female	1.52 (1.29-1.79)	
Per capita income/mo. (US\$) <sup>a</sup>	195-max	1	0.005*
	93-194	0.90 (0.48-1.69)	
	57-92	0.60 (0.33-1.09)	
	0-56	0.44 (0.27-0.72)	
Schooling (yrs) <sup>a</sup>		0.95 (0.91-1.00)	0.05
Income X Schooling (yrs) <sup>a</sup>	195-max	1	0.02**
	93-194	0.99 (0.92-1.07)	
	57-92	1.06 (0.98-1.14)	
	0-56	1.09 (1.03-1.18)	
Stressful life events <sup>b</sup>	None	1	0.008***
	1	1.06 (0.86-1.31)	
	2 or more	1.44 (1.11-1.86)	
Regular source of care <sup>c</sup>	None	1	0.001***
	Regular place	1.63 (1.25-2.13)	
	Regular doctor	1.70 (1.28-2.27)	
Health insurance <sup>c</sup>		1.47 (1.21-1.80)	0.001
Serious symptom		1.20 (1.02-1.40)	0.02
Self-reported health <sup>c</sup>	Excellent	1	0.001***
	Good	1.65 (1.21-2.24)	
	Poor/regular	2.96 (2.16-4.07)	
Inactivity days <sup>c</sup>		1.57 (1.26-1.95)	0.001

<sup>a</sup>probability of one or more PR=1.

\*\*heterogeneity test.

\*\*\*linear trend test.

<sup>a</sup>First level: Age, sex, income, education, income x education (N=1,242).

<sup>b</sup>Second level: First level and stressful life events (N=1,236).

<sup>c</sup>Third level: Second level and regular doctor, regular place, health insurance, self-reported health, inactivity days (N=1,226).

recall bias. However, as the outcome was measured in a dichotomous way and for a time period of two months, it was easier to recall whether there was a visit to the doctor or not. Moreover, recent studies have showed that self-reported use reasonably estimates registered utilization information in different socioeconomic groups.<sup>12</sup>

Second, as for the study design, none of the established associations can be inferred as a cause-effect relation because temporal criteria between outcome and independent variables were not sufficiently established. It cannot be discarded also reverse causality between the outcome and some independent variables. This is the case for regular source of care and health services utilization. It could be argued that if a subject made more doctor visits, they would be more likely to have a regular doctor. However, evidence from longitudinal studies has shown that the direction of causality can be in the manner suggested here.<sup>10</sup>

Finally, as data losses were an acceptable seven percent, it can be assumed that selection bias was not an actual problem. Available data from losses (56 out of 88) show that the mean age was not different from the sample mean (losses: 42.06 yrs, SD 17.86; sample: 40.3 yrs, SD 17.71; p=0.4). However, the propor-

tion of men in the losses was higher than in the sample (69% vs. 46%, p=0.01). If men who did not answer the questionnaire were more likely to visit a doctor, the PR observed in women could have been overestimated. However, another study in Brazil found a comparable effect.<sup>3</sup>

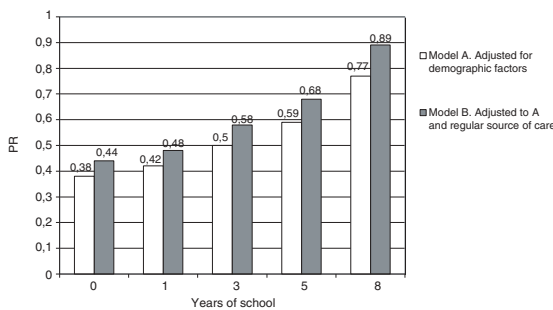
It was expected a higher use in the 65 yrs or more age group. Although this was verified the results were not significant. However, when the outcome was measured for the last 12 months (where a higher proportion of subjects with this profile visited the doctor), the variable was significant even after adjustment for other factors.

Individual's social and psychological characteristics can affect health services utilization, as showed by the dose-response relationship for stressful events. But neither social support nor family dysfunction was associated to the outcome.

Regular source of care (doctor or site) showed, as other studies, a dose-response relationship with outcome.<sup>6</sup> However, after adjustment, although the trend persisted, the effects of both categories became very similar. Health insurance maintained the same PR, even after adjusting for potential confounders.

Variables related to health needs were the most important, confirming other studies, and self-reported health showed a dose-response relationship with outcome. Chronic health conditions lost its effect after adjustment, but with the outcome measured for 12 months, it remained associated even after adjustment. This could indicate that a period of two months could be too short for observing a difference in utilization rates among people with a chronic health conditions, at least for a dichotomous outcome.

Analysis of social differences in visiting a doctor for the higher level of needs showed the existence



**Figure 2** - Modifier effect of schooling in PR for visiting a doctor among the poorest income group with chronic disease, and according to adjusted model. Rio Grande, Brazil, 2000.

**Table 3** - Prevalence ratios for visiting a doctor in persons with chronic health problems, and socioeconomic factors. Rio Grande, Brazil, 2000.

Characteristic	Model A* PR (CI 95%)	p	Model B** PR (CI 95%)	p
Per capita income/mo (US\$)				
195-max	1		1	
93-194	0.88 (0.49-1.58)	0.04***	0.91 (0.50-1.64)	0.1***
57-92	0.60 (0.33-1.09)		0.66 (0.35-1.23)	
0-56	0.38 (0.19-0.77)		0.44 (0.23-0.85)	
Schooling (yrs)	0.95 (0.91-0.99)	0.02	0.95 (0.90-0.99)	0.01
Income X Schooling (yrs)				
195-max	1		1	
93-194	0.97 (0.89-1.06)	0.02****	0.98 (0.90-1.07)	0.02****
57-92	1.04 (0.93-1.17)		1.04 (0.92-1.17)	
0-56	1.15 (1.05-1.27)		1.15 (1.05-1.26)	

\*adjusted to age and gender (N=316).

\*\*adjusted to age, gender, and regular source of care (N=315).

\*\*\*probability of one or more PR=1.

\*\*\*\*heterogeneity test.

of inequity for the lowest income group. But this situation could be modified by means of an interaction between education and income. If the poorest group had any schooling, the chance of visiting a doctor increased. In addition, after adjustment with "regular source of care", the gap between this group and the wealthier ones was reduced even more. The modifier effect of schooling in the two highest income groups was opposite, reducing the chance of visiting a doctor.

The variable distance to health facility, an important factor of health services utilization, was not analyzed in this occasion because the study included all the potential users, even those that did not visit the doctor in the last two months but may have had health needs, and to whom this variable would not apply.

Finally, as recommendations, Brazilian health policymakers need to be aware that despite universal provision and free access of the new system, there is still

some degree of inequity; the poorest and least educated group still uses the health services to a lesser extent. As more education can improve access and diminish the inequity in this underserved group, it may be that the problem is a lack of knowledge about accessing and gaining entry into the health system. Therefore, in conjunction with obvious structural changes necessary to improve education in the population, other specific policies and measures can be effective for improving health services utilization in the underserved group. For example, educational campaigns on when and how to get access to the health system. Furthermore, having a regular source of care (doctor or site) has to be encouraged especially among the poorest groups, as this can reduce health services utilization gap, and improve quality of health attention.

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